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ABSTRACT

A study investigated the appropriate use and interpretation of a phonological test, the Computer Analysis of Phonological Processes (CAPP), with children who are not speakers of Standard English. In the test, three-dimensional objects are used to elicit spontaneously a carefully designed word list including all American English phonemes and 31 consonant clusters. The CAPP requires less than 20 minutes to administer and can be scored manually or by computer. Subjects were seventy-two 4-year-old speakers of Black English in three Head Start programs. Results indicate that while Black English phonological rules do affect specific test items on the CAPP, the information provided by the test appears not to be negatively influenced by the Black English dialect spoken by the children. In two case studies, the CAPP provided useful information for speech-language pathologists to help determine the degree of articulation disorder, amount of pattern deviations, type of therapy most appropriate for the child, and amount of improvement gained. (Author/MSE)

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by
Kimberly O. Fleming
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St. Lucie County Public Schools

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F.E.R.C. NOTES ON THIS BULLETIN

The question of cultural diversity and the ability to deal with it with fairness and objectivity has long been a problem to educators. With the rapid increase of multilingual as well as multicultural student enrollments makes the necessity of finding between ways and means of objectivity have intensified. This study is a step in the right direction and is a valuable resource for schools facing this dilemma.

Charlie T. Council
Executive Director

Abstract

The purpose of this study was to provide information on the appropriate use and interpretation of the *Computer Analysis of Phonological Processes* (CAPP, Hodson, 1985) with children in Florida who are not speakers of Standard English. Seventy-two black four year olds participated in the study. While Black English phonological rules do affect specific test items on the CAPP, it appeared that the information provided by the CAPP was not negatively influenced by the black dialect spoken by the children. For two case studies, the CAPP provided useful information for the speech-language pathologist to help determine the degree of articulation disorder, the amount of pattern deviations, the type of therapy which would be most appropriate for the child, and the amount of improvement gained.

Establishing Validity

Speech and language impairments are defined as disorders of language, articulation, fluency, or voice which interfere with communication, preacademic or academic learning, vocational training, or social adjustment. Students with communicative disorders constitute the largest population of school-age children with handicaps. Further, the articulation disorder or the use of deviant phonological processes is the most common communicative disorder.

According to Florida's criteria for eligibility that has been in effect since August 1, 1988, an articulation disorder is present when at least one of the following is met:

1. Based on normative data, the frequency of incorrect sound production and the delay of correct sound production are significant.

2. The error pattern is characteristic of disordered rather than delayed acquisition.

3. Articulation is rated as moderately or severely impaired on an articulation severity rating scale.

In making decisions concerning eligibility for articulation, additional factors such as regional and cultural variations, intelligibility, and stimulability are to be taken into consideration. The first of these three, regional and cultural variations, is of primary importance to this study.

In 1983, a controversy surrounding the inclusion of dialectically different students in speech and language programs brought about the drafting of a position paper by the American Speech-Language-Hearing Association (ASHA) suggesting that the speech-language pathologist become more adept in the identification of differences as opposed to disorders. Children classified as having dialectical differences exhibit linguistic features which are common to a particular geographic region or to speakers of an ethnic dialect. According to ASHA, children's use of word formation rules must always be evaluated against the dialectical background in order to determine which deviations must be attributed to dialectical differences and which to deficits in the acquisition of the standard rules. Children who exhibit phonological differences due to regional or cultural variations of English should be excluded from articulation eligibility, according to ASHA and Florida's Subcommittee on eligibility.

This study addressed the need identified by ASHA and Florida's Steering Committee for Programs for the Speech and Language-Impaired. That is, to distinguish ethnic phonological differences from disorders for eligibility purposes. This study also responded to an American Psychological Association (APA) standard regarding the testing of linguistic minorities which calls for studies to provide evidence of test validity and reliability with specific linguistic groups: "For non-native English speakers or for speakers of some dialects of English, testing should be designed to minimize threats to test reliability and validity that may arise from language deficiencies" (*Standards for Educational and Psychological Testing*, APA, 1985, p. 74).

The issue of culturally valid assessment has been addressed by numerous researchers, most recently by Cole and Taylor (1990). Their study examined the extent to which Black children's performance on three tests of articulation was likely to be misdiagnosed when dialect considerations were not taken into account. The three tests were the picture test of the Templin-Darley Tests of Articulation, Second Edition (Templin & Darley, 1969); the Arizona Articulation Proficiency Scale, Revised (Fudala, 1974); and the Photo Articulation Test (Pendergast, Dickey, Selman, & Sorder, 1969). Their results show that a failure to consider dialect variation increases the likelihood of misdiagnosing normally speaking Black children as having articulation disorders. However, their findings related to such factors as the name of items, and phoneme type and position, suggest that the mere adjustments for dialect bias will not necessarily improve the validity of articulation instruments.

The purpose of this study was to provide information on the appropriate use and interpretation of the *Computer Analysis of Phonological Processes* (CAPP, Hodson, 1985) with black children in Florida who are not speakers of Standard English. More specifically the following questions were to be answered: a) Among black preschool children, does the *Computer Analysis of Phonological Processes* (CAPP) differentiate between those children who are developing their phonological rules in a normal sequence for their ethnic environment, and those children who have a disordered phonological system? b) Can the CAPP's severity interval scale combined with the 40 percent deviancy per pattern criteria be used with preschool speakers of Black English? Or will the phonological rules of Black English inflate the deviancy score receive on the CAPP? c) Are specific test items affected by the Black English phonological rules?

To assist readers with the description of the instrument, several terms are defined:

Phonological pattern. The standard adult speech patterns of a

linguistic community including sound classes, shapes and syllable sequences.

Phonological process or deficient pattern. A regularly occurring deviation from standard adult speech patterns.

Phonology. The sound structure of language, characterized by a finite set of phonemes (sounds which signal a change in meaning) and specific arrangements in which they can be combined into syllables.

Instrument

The *Computer Analysis of Phonological Processes* (CAPP, Hodson, 1985) contains the same test items as the *Assessment of Phonological Processes-Revised* (APP-R, Hodson, 1986). The original *Assessment of Phonological Processes* (APP, Hodson, 1980) was developed during six years of direct day-to-day experience in the remediation of deviant phonological systems in 125 children. Many of these children were judged to be virtually unintelligible in connected speech at referral-when their ages ranged from three to nine years.

To administer the CAPP, three-dimensional objects are used to elicit spontaneously a carefully designed word list. This specific procedure of single-word elicitation serves to be most effective for assessing highly unintelligible children's speech since it may not be possible to determine accurately children's deviations without knowledge of the target word. This procedure also allows for re-administration at a later time, yielding results which can be directly compared. Furthermore, the CAPP secures a broad sampling by including the assessment of all American English phonemes (at least twice) and 31 common consonant clusters, four of which are three-segment clusters. Yet, the CAPP can be administered in a short time (typically less than 20 minutes), and can be scored with a computer in roughly ten minutes or scored manually in approximately 30 minutes.

The scoring of the CAPP provides information to determine priority clients and priority deficient patterns. In the former decisions, a composite score which provides an independent index of the severity of the child's deviations is derived using the following

formula:

1. Determine percentage-of-occurrence score for each basic deficient pattern (i.e., syllable and cluster reductions, obstruent singleton omission; stridency, velar, liquid, nasal, and glide deviations).
2. Obtain the mean of the ten basic deficient patterns.
3. Add points for other deficient patterns and for age.

The composite score is interpreted using the intervals shown in Table 1. These intervals are meant to serve as indicators rather than absolute divisions. These severity intervals were determined by Hodson based on the length of remediation time required as well as the initial intelligibility level of each of the original subjects. Moderate to profound disorders warrant phonological remediation; a mild disorder may require the traditional phoneme approach rather than the phonological approach.

Table 1

Interpretation of CAPP Composite Scores

Severity Interval	Composite Score
Mild	19 and below
Moderate	20 - 39
Severe	40 - 59
Profound	60 and above

To determine priority deficient patterns, Hodson derived deficient phonological patterns among four levels of intelligibility from Level 0 (least intelligible) to Level III. These levels were not intended to be mutually exclusive. Rather, children tend to use deficient patterns which span two or perhaps even three levels. Within each level, only those patterns which are scored at 40 percent occurrence or above are scrutinized to determine if phonological intervention is indicated.

Method

Subjects

Seventy-two black four year old children participated in this study. There were 39 (54%) males and 33 (46%) females. The children

were enrolled in Head Start programs in three Southeastern counties in Florida. All children passed the vision screening, while two children failed the hearing screening. Sixty-eight children passed an informal language screening. One child had previously been enrolled in a speech and language program. Two children were referred for language testing; one child was referred for dysfluency. No children were diagnosed as handicapped.

Procedure

The CAPP was administered to all children by speech-language pathologists during September and October 1989. Responses were transcribed live by the speech-language pathologist administering the test. Audio tapes also were recorded for each subject during the test administration. The lead speech-language pathologist systematically selected every tenth audio tape/protocol to verify the consistency of transcripts across the CAPP administrators. The lead speech-language pathologist scored the protocols using the computer. The Head Start teachers, who were familiar with the black dialect, provided an intelligibility rating which was based on the child's performance in the classroom. The teachers were asked to select a category which described how well they could understand the child's sentences. These categories were:

1. I can understand everything.
2. I can understand most of what is said.
3. I can understand half of what is said.
4. I can understand only a few words.
5. I can not understand anything.

While intelligible speech does not indicate perfect articulation, it was a factor in the degree of communicative success which the child was experiencing.

This success was felt by the authors to be critical for the child's social and pre-academic development.

Results

The phonological deviancy scores for sixty-two (86%) children were considered to be within the normal limits on this instrument. As shown in figure 1, these normal scores ranged from 1 to 19. Of the remaining ten children, eight (11%) received a deviancy score which placed them in the moderate range of severity (20-39); two (3%) children scored in the severe range (40-59).

Figure 1. Frequency of normal black four year olds by average of phonological processes.

A study completed by Hodson and Paden (1983) reported that the phonological structure of normal four year old children closely approximated the phonological system of adults. This conclusion was partially based on the Percentage-of-Occurrence Means for basic deficient patterns. Table 2 reveals that the results of the present research with black students in Florida are similar to the results from Hodson and Paden's work with white children in Illinois.

Table 2

Percentage-of-Occurrence Means for Basic Deficient Patterns

Basic Deficient Pattern	Means for Normal Four Year Olds			
	Hodson and Paden (N=60)	Fleming and Hartman (N=62)		
	Mean	Mean	SD	Range
Syllable Reduction	1	2	3.3	0-16
Cluster Reduction	6	14	10	3-45
Singleton Omission				
Prevocalic	1	1	.82	0-05
Postvocalic	1	11	9.9	0-42
Stridency Deletion	4	12	12.5	0-63
Velar Deviation	4	10	7.2	0-32
Liquid Deviation				
/l/	15	3	7.9	0-45
/r/	20	12	10.6	0-43
Nasal Omission	2	4	5.2	0-21
Glide Omission	7	9	11.5	0-50

The CAPP indicates that if a deficient pattern is above 39 percent it should be considered for remediation. Table 3 lists the number and percentage of the 62 normal black four year olds who scored above 39 percent deviancy per pattern.

Table 3

Numbers and Percentages of Children (N=62) Scoring Above 39 Percent Deviancy Per Pattern

Basic Deficient Pattern	N	Percent
Syllable Reduction	0	0%
Singleton Omission		
Prevocalic	0	0%
Postvocalic	1	2%
Consonant Sequence Reduction	1	2%
Stridency Deletion	3	5%
Velar Deviation	0	0%
Liquid Deviation		
/l/	1	2%
/r/	1	2%
Nasal Omission	0	0%
Glide Omission	1	2%

For the 62 normal black children, the Head Start teachers reported that they could understand "everything" that 39 (63%) of the children said; they could understand "most of what is said" for 17 (27%) children; "half of what is said" for three (5%) of the children. Information for three of the children's intelligibility was not reported.

Table 4 ranks specific test items based on the percentage of the normal black four year olds who made an error on each item. A comparison of the two groups of children revealed that of the subjects who scored in the moderate and severe ranges, 23 specific items were missed by at least 80 percent of the children. However, only two specific test items (toothbrush and mouth) were missed by 80 percent or more of the normal subjects.

Table 4

Numbers and Percentages of Four-year Olds Who Missed Test Items

CAPP Items	Normal (N=62)		Disorder (N=10)	
	N	Percent	N	Percent
toothbrush	56	90	10	100
mouth	55	89	10	100
glove	44	71	10	100
mask	43	69	8	80
thumb	36	58	8	80
ice cubes	34	55	10	100
string	34	55	9	90
fork	33	45	5	50
santa claus	31	50	10	100
feather	30	48	8	80
music box	30	48	8	80
screwdriver	30	48	10	100
cowboy hat	28	45	9	90
jump rope	27	44	9	90
vase	27	44	7	70
television	24	39	7	70
basket	23	37	9	90
soap	22	36	8	80
crayons	21	34	6	60
smoke	21	34	9	90
gum	20	32	4	40
rock	20	32	9	90
zipper	20	32	6	60
boats	19	31	6	60
horse	19	31	4	40
slide	18	29	8	80
spoon	18	29	7	70
snake	17	27	8	80
nose	16	26	3	30
square	16	26	7	30

Table 4 (continued)

CAPP Items	Normal (N=62)		Disorder (N=10)	
	N	Percent	N	Percent
three	15	24	8	80
truck	15	24	7	70
star	14	23	6	60
glasses	13	21	9	90
black	10	16	8	80
plane	10	16	5	50
yellow	8	13	5	50
flower	6	10	6	60
leaf	6	10	5	50
page	6	10	5	50
green	5	8	4	40
candle	4	7	4	40
chair	4	7	3	30
queen	4	7	5	50
watch	4	7	3	30
fish	3	5	3	30
hanger	2	3	3	30
shoe	2	3	1	10
yoyo	2	3	0	0

To determine the phonological rules of Black English, the primary researcher used the information from Williams and Wolfram (1977) provided in *A Resource Manual for the Development and Evaluation of Special Programs for Exceptional Students* (Florida Department of Education, 1988). A review of these sources indicated that Black English phonological rules may affect specific items on the CAPP. Table 5 shows the percentage of normal and speech disordered black four year olds who missed each item (first and third numerical columns, respectively) and the percentage who missed each item due to a Black English phonological rule (second and fourth numerical columns). For the normal children, if they followed a Black

English Rule it often was the only sound alteration made. However, for the speech disordered children, they made errors in addition to following the Black English rules.

Table 5

Percentages of Total Errors and Errors Related to Black English (BE) Phonological Rules

Black English (BE) Phonological Rule	CAPP Item	Percentages of Errors Normal (N=62) Total	Normal (N=62) BE	Disorder (N=10) Total	Disorder (N=10) BE
1. Cluster reduction	boats	31	12	60	30
in final position	crayons	34	10	60	10
when both members	ice cubes	55	34	100	30
of the cluster are	mask	69	57	80	60
voiced or voiceless.	music box	48	12	80	50
2. Initial position	three	24	23	80	50
substitution of /d,t,f/	thumb	58	51	80	70
for "th."					
3. Medial and final	mouth	89	89	100	80
substitutions of /f/	toothbrush	90	25	100	10
for "th."					
4. Medial substi-	feather	48	03	80	00
tution of /v/ for "th."					
5. Omission of /r/	fork	53	36	50	20
when followed by a	horse	31	27	40	30
consonant.					
6. Omission of /l/	television	39	00	70	20
when preceded and	yellow	13	00	50	10
followed by a vowel.					
7. Omission of	slide	29	17	80	30
final /d/.					

Table 5 *continued*

Black English (BE) Phonological Rule	CAPP Item	Percentages of Errors Normal (N=62) Total	Normal (N=62) BE	Disorder (N=10) Total	Disorder (N=10) BE
7. Omission of final /d/.	slide	29	17	80	30
8. Omission of /d/ when followed by a consonant.	screwdriver	48	00	100	00
9. Substitution of a nasalized vowel for a final position nasal.	green	08	02	40	00
	gum	32	27	40	30
	plane	16	15	50	20
	queen	07	05	50	30
	spoon	29	05	70	00
	string	55	02	90	00
	television	39	00	70	00
	thumb	58	10	80	30
10. Substitution of /skr/ for /strl/.	string	55	28	90	10
11. Substitution of /ks/ for /sk/.	basket	37	03	90	00
	ice cubes	55	00	100	00
	mask	69	02	80	00
12. Omission of one member of a consonant cluster in the medial position when both are voiced or voiceless.	basket	37	14	90	50
	ice cubes	55	05	100	20

For each of the Black English phonological rules, figure 2 shows the percentage of normal and disordered black four year olds who made

sound production changes by following these rules. Conversely, misarticulations which were not attributed to following the identified Black English rules can be seen in figure 3. While normal four year olds were expected to produce some developmental errors, the disordered subjects produced per pattern from ten percent to 53 percent more errors than the normal subjects.

Figure 2. Percentage of normal and disordered black four year olds following Black English phonological rules.

Figure 3. Percentage of normal and disordered black four year olds making errors unrelated to Black English phonological rules.

Having analyzed the responses of the black four year olds for indications of following the identified Black English phonological rules, the primary researcher suggests that two additional rules may be evidenced by these children which were not described in the *Reference Manual*. These possible Black English rules are:

1. Omission of the medial voiceless "th." Sixty-eight percent of the normal black four year olds omitted the voiceless "th" in the word toothbrush.

2. Substitution of /d/ for the voiced "th" in the medial position. Forty-one percent of the children substituted /d/ for the voiced "th" in feather.

The Computer Analysis of Phonological Processes (CAPP) was completed on a fictitious four year old who followed 100 percent of the Black English phonological rules previously described. The results indicated that the average of phonological processes was 15; therefore, this child would not be a candidate for the phonological approach. A description of the pattern deviations received by the fictitious black four year old are shown in Table 6.

Table 6

Phonological Analysis Summary for Fictitious Normal Black Four Year Old Making All Possible Black Dialect Modifications

Basic Deficient Pattern	Percentage of Occurrence
Syllable Reduction	0
Singleton Omission	
Prevocalic	5
Postvocalic	29
Consonant Sequence Reduction	23
Stridency Deletion	14
Velar Deviation	5
Liquid Deviation	
/l/	18
/r/	10
Nasal Omission	42
Glide Omission	0

Average of Phonological Processes: 15

A second CAPP was completed on a more typical fictitious four year old. This fictitious subject followed the Black English phonological rules to the same extent (the same percentage of use) as the normal subjects in the study. This second analysis displayed in Table 7 reveals that a child, who followed Black English phonological rules, could make additional developmental errors, yet would not score within the deviant severity ranges.

Table 7

Phonological Analysis Summary for Fictitious Normal Black Four Year Old Making Typical Black Dialect Modifications

Basic Deficient Pattern	Percentage of Occurrence
Syllable Reduction	0
Singleton Omission	
Prevocalic	0
Postvocalic	6
Consonant Sequence Reduction	5
Stridency Deletion	7
Velar Deviation	5
Liquid Deviation	
/l/	0
/r/	5
Nasal Omission	5
Glide Omission	0

Average of Phonological Processes: 3

Case Studies

Two of the black four year olds who had articulation or speech disorders as identified by the *Computer Analysis of Phonological Processes* (CAPP) received therapy during the 1989-90 school year. Case studies were completed to determine if the CAPP provided useful diagnostic and intervention information for children who speak Black English.

Two children who were diagnosed by the Prekindergarten Diagnostician as demonstrating articulation disorders were M.S. and C.K. Both children participated in the school's Phonological Alternative Strategies to Speech (PASS) program. The PASS program was designed based on the phonological approach described by Hodson and Paden (1983). This program did not specifically address dialectical errors.

A speech-language pathologist provided speech therapy to M.S.

and C.K. in a group containing three other preschoolers who demonstrated phonological disorders. The PASS group met once a week for a two hour period. This two hour therapy session included auditory bombardment, phonological treatment, and generalization opportunities. In addition to the group therapy session, each child received an individual session of twenty minutes per week. The individual session focused on the selection of target words within a deviancy pattern.

M.S., a black male, was diagnosed as having congenital atresia of the right ear. His father reported that M.S. has had frequent colds, sore throats, and earaches. M.S.'s articulation skills were initially evaluated on 11-10-88. At that time, the CAPP revealed a phonological deviancy score of 42 and a severity interval of severe. Conversational intelligibility was judged by the Diagnostician to be poor. Language skills were determined to be within normal limits. Hearing acuity for the left ear was passed at 25db Hz. Due to age requirements established by the state, M.S. was not eligible to receive services until August of 1989. M.S. initiated the PASS program at age four years. Upon completion of the school year, M.S. had received 43 hours of therapy. Phonological patterns which were targeted during therapy were: consonant sequences, stridents, velars, and liquids /l/ and /r/. Each pattern was facilitated for two weeks, using two different sounds of the pattern. Home activities were also completed for each pattern. M.S. had completed his second phonological cycle by the end of the school year. Post-testing completed 3-28-90, resulted in a phonological deviancy score of 25 and a severity interval of moderate. Specifically, the percentage of occurrence for pattern deviations had made the following reductions:

1. Consonant sequences	83% to 55%
2. Stridents	67% to 30%
3. Velars	86% to 41%
4. Liquid /l/	82% to 0%
5. Liquid /r/	43% to 29%

The speech-language pathologist recommended that M.S. continue in the PASS program during the next school year. Patterns to be targeted included: consonant sequences, velars, and glides which had increased from 20 percent to 40 percent.

C.K., also a black male, was referred by his Head Start teacher because she could only understand a few words. He did not present a significant medical history. The CAPP was administered on 8-23-

89. C.K. received a phonological deviancy score of 41 with a severity interval of severe. Vision and hearing screenings were passed. Expressive language skills were depressed; however, C.K.'s poor articulation skills were considered to be a contributing factor. C.K. was four years and nine months old when he began the PASS program. He had received 34 hours of therapy by the end of the school year. Phonological patterns which were treated were consonant sequences, stridents, velars, and liquids /l/ and /r/. Each pattern was focused on for two weeks with two different sounds for each pattern. The speech-language pathologist did not believe that home activities had been completed. C.K. had entered his third cycle at the end of the school year. Post-testing completed on 3-7-90 revealed the following improvements in the percentage of occurrence for the pattern deviations:

1. Consonant sequences 63% to 58%
2. Stridents 47% to 28%
3. Velars 64% to 36%
4. Liquid /l/ 91% to 73%
5. Liquid /r/ 48% to 43%

The phonological deviancy score was 38 with a severity interval of moderate. The deviancy score included a 10 point penalty for age five years. The speech-language pathologist recommended that consonant sequences, and liquids /l/ and /r/ should be targeted during the next school year.

In summary, the CAPP provided useful information for the speech-language pathologist to help determine the degree of articulation disorder, the amount of pattern deviations, the amount of improvement gained, and which type of therapy would be most appropriate for the child. The results of the Weiss Articulation Test (1978), a traditional test which evaluates each sound independently, confirmed the results of the CAPP. Therefore, it appeared that the information provided by the CAPP was not negatively influenced by the black dialect spoken by the children.

DISCUSSION

During the prekindergarten years, children experience tremendous growth as individuals, as well as great variety in rates of

learning as a whole. The determination of a child's lack of development in any area must be based upon a number of informational sources. Some of these sources may include direct observation in a variety of settings, parent and teacher interviews, developmental checklists, and formalized tests. The *Computer Analysis of Phonological Processes* (CAPP) is an instrument which may aid the speech-language pathologist in analyzing a preschooler's phonological system. Specifically, the research from the present study supports the conclusion that the CAPP is a valid diagnostic tool for differentiating between black four year old children who are developing their phonological rules in a normal sequence from those who have a disordered phonological system.

Although there were Black English phonological rules which affected specific items on the test, most (86%) of the children did not demonstrate deviant phonological patterns as analyzed by the CAPP. Conversely, the assessment did not appear to falsely identify children as normal since the teacher intelligibility ratings indicated that 90 percent of the children who scored with normal limits had good intelligibility. The Weiss Comprehensive Articulation Test Manual lists that a normal four year old's level of intelligibility should be at least 90. Therefore, one would expect that good intelligibility would indicate speech skills to be developed within normal limits for four year olds. The poor intelligibility rating received by three (5%) of the children may have been related to their rate of speech, dysfluencies, or language difficulties. The similarity with Hodson and Paden's (1983) results regarding the low percentage-of-occurrence means for the basic deficient patterns suggests that the children had developed their phonological systems to a comparable level. The criteria of targeting patterns which are above 39 percent deviancy was supported by the fact that at least 95 percent of the normal black children scored below 39 percent deviancy per pattern. In addition to this finding, 71 percent of the normal four year olds' Average of Phonological Processes were scored ten or below. This indicated that the children were not "borderline," but well below the severity interval cutoff of 20. It is also interesting to note that the average of phonological processes received by the fictitious four year old, who applied the Black English rules to all test items, would not be a candidate for the phonological approach.

A review of the results regarding the Black English phonological rules which apply to the CAPP suggests that the rule of initial, medial, and final substitution of voiceless "th" was most likely to inflate the scores received on the assessment. "Mask" was a specific test item which was also scored negatively due to a Black English rule; however, the rule was not applied consistently to all of the test items.

Further analysis of the percentage of children who missed specific test items revealed that the ten children who scored 20 or above on the CAPP often produced errors which were not related to Black English rules. In fact, the disordered subjects produced a mean of 29 percent more misarticulations, which were not related to Black English, than the normal subjects. These same children also applied the Black English rules more consistently than the normal four year olds. Williams and Wolfram (1977) stated "it is important to note that many features occur variably; that is, a particular dialect may be characterized by the frequency with which certain variants occur, rather than their categorical occurrence." It is possible that the children who demonstrated disordered patterns were falsely processing the entire phonological system, both Standard English and Black English Variations, of their adults.

The Prekindergarten Assessment and Training for the Handicapped Student Evaluation Manual (1989) indicated that it was best practice to administer an assessment which would not only provide eligibility information but also programming information. The CAPP provided information which was directly applicable to identifying a treatment program. Furthermore, the two case studies presented suggested that Black English phonological rules did not interfere with the treatment program.

In summary, Black English phonological rules do affect specific test items on the CAPP. However, these same rules do not invalidate this assessment when the rules are applied to the assessment as a whole. The CAPP's severity intervals combined with the 40 percent deviancy per pattern criteria successfully differentiated between normal black four year olds and black four year olds who had a disordered phonological system. The interpretation of the scores received on the CAPP must be reviewed based on the individual child's production patterns. One must determine if the child's scores are falsely inflated due to following Black English rules. However, the possibility that the child has developed a disordered phonological system should not be ruled out based solely on the inclusion of Black English phonological rules. Factors which should also be considered include: a) age, b) number and type of deviant patterns identified, c) level of intelligibility as judged by those familiar with the child's culture, and d) the specific phonological rules which the child has applied to the test items.

These areas of consideration are especially relevant for children who score in the upper mild to moderate severity range on this instrument. A review of the child's sound productions may reveal that although the child's score is within normal limits on the CAPP, misarticulated sounds are not developmental. Therefore, an alterna-

tive treatment method such as a phoneme approach may be warranted. Additionally, for a child who scored in the moderate range, one must carefully consider information in Table 4 regarding which and for what reason that test item was misarticulated. This comparison should decrease the number of children who are falsely identified as phonologically disordered.

The reader may choose an alternative procedure for using the information provided by the CAPP. One example of an alternative method would be to disregard any misarticulations which could be attributed to Black English phonological rules. However, this approach assumes that Black English phonological rules dictate that the rules are followed 100 percent of the time. The present research does not support this assumption; perhaps because children were most likely influenced by both Black English and Standard English models.

The completion of this investigation leads to additional questions regarding the Black English phonological system. The most relevant questions to this study are:

1. Will these results hold true for three and five year old children?
2. How often are the Black English rules applied to Standard English by adult speakers?
3. Are some of the test items semantically inappropriate for this culture?

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